

# Action Research Projects in Pre-Service Teacher Education

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## **Abstract**

*Classroom-centered Action Research Projects are an integral component of the M.S. in Elementary Education Program at the University's (pseudonym) College of Education. This article provides a summary and discussion of the projects completed by students in the Science, Technology, Literacy and English Language Learner Specializations of the Masters' program.*

In 2003, the Education Department at the University (pseudonym) (now the College of Education at the University) moved from an undergraduate licensure program to a five-year licensure program with a M.S. in Elementary Education awarded after the end of the fifth year. Students would still receive their BA/BS degrees and take Education courses during their undergraduate years, but they would now continue for an additional year. During this year, the would be taking only Education coursework and doing a year long practicum/student teaching internship.

The change was dictated by two factors: an increase in licensure requirements, often causing students to delay their

student teaching semester until after they had graduated, and requests from local school districts that we produce new teachers who would also be leaders in their schools. The addition of a fifth year would deal with the first issue. As for developing school leaders, the Department decided that this need would best be served by providing students a level of expertise in an area related to teaching. These areas would be called “specialization areas”, and during the final semester of their undergraduate year, students would choose one of the specialization areas for the following graduate year.

During this fifth year of coursework, students choose a specialization area in which they develop a level of expertise in a specific area related to teaching. The students acquire this expertise through: 1) graduate-level seminars, working with faculty advisors who are researchers in that particular specialization field, 2) a student-teaching internship placement with a mentor teacher skilled in that area, and 3) an action research project, implemented in the internship classroom, developed around what the interns and mentor teachers view as a need for students. The action research project is a very strong component of this program. Our view of what action research should be is well articulated by Ferrance (2000):

Typically, action research is undertaken in a school setting. It is a reflective process that allows for inquiry and discussion as components of the “research.” Often, action research is a collaborative activity among colleagues searching for solutions to everyday, real problems experienced in schools, or looking for ways to improve instruction and increase student achievement. Rather than dealing with the theoretical, action research allows practitioners to address those concerns that are closest to them, ones over which they can exhibit some influence and make change. (p. vi)

This article provides a summary and discussion of the projects completed by students in the Science, Technology, Literacy and English Language Learner Specializations of the Masters’ program.

## **Benefits of Action Research**

The use of action research in teacher education is not a new concept (Cochran-Smith & Lytle, 1993; Noffke & Zeichner, 1987). Though most often used by in-service teachers, research has demonstrated the benefits of using action research in pre-service teacher education programs (Kosnik, 1999; Peters & Gray, 2007). These benefits include: 1) bringing prospective teachers into the intricate process of teaching and learning, 2) promoting deep reflection on practice inside the classroom, and 3) creating habits of “self-monitoring” for pre-service teachers to take into their future careers as educators (Caro-Bruce et. al., 2007; Kosnik, 1999; Zeichner & Gore, 1995). Peters & Gray (2007) indicate that pre-service teachers can “learn best if they actually experience the process of inquiry...and if their learning experience is grounded in their own practices” (p. 327).

## **The Fifth Year**

During the first semester of the fifth year, students take graduate-level coursework in Inclusive Classrooms, Models of Instruction, and Educational Research. In addition, they have a graduate seminar in their specialization area during which they plan their action research project. The specialization areas are: Arts, Literacy, Instructional Technology, Mathematics, Science, Social Studies, and Special Education. A specialization in teaching English Language Learners (ELLs) was added last year due to the increasing numbers of ELLs in local schools. The number of students choosing a particular specialization varies from year to year, but it is generally between four and six. The program graduates about 36 students each year.

In addition to coursework, students have a fifteen-hour/week practicum requirement in the Fall of their M.S. year, with their practicum assignments closely connected to their coursework. This practicum takes place in one classroom, in the school where the students will also do their second-semester student teaching internship. The grade level for the practicum is determined by the grade level chosen by the student for his/her student teaching internship. Therefore, if a student chooses to do

his/her student teaching internship in an upper level grade, the practicum will be in a lower level grade.

The second semester of the M.S. year is the student teaching internship. The intern is placed with a mentor teacher who has expertise and experience in the chosen specialization area.

During this semester, along with all the other responsibilities and tasks expected of a student intern, the intern implements his/her action research project. The results of the action research are presented to an audience of faculty, peers, and mentor teachers during a research symposium held during final exams week.

### **Specialization Seminars**

Students who have chosen a particular specialization enroll in a seminar for that area during the Fall semester of their graduate year. The seminars meet weekly throughout the semester and involve discussions of assigned readings relevant to the specialization and considerations of teaching strategies and approaches for the specialty area.

During the second half of the seminar, discussion of possible action research topics begins. The students are encouraged to discuss possible research areas with their second-semester mentor teacher in whose classroom the study will take place. Once they have developed their research ideas, students review relevant literature and plan their methodology. As the semester progresses, students develop their action research proposal. This proposal consists of introduction/rationale, literature review, and methodology sections. At the end of the semester, students present their proposals to a group of faculty and an audience of their fellow graduate students. Each presentation is followed by time set aside for questions and discussion.

As indicated earlier, the action research project is implemented during the second semester during the student's internship. The implementation takes place with guidance from the mentor teacher and the specialization area faculty member, who also acts as the student's internship supervisor. At the end of the internship, the student writes his/her research paper and prepares a final research presentation. The presentation consists of the previous Introduction/Rationale, Literature Review, and

Methodology, with the addition of Results, Discussion and Implications sections. The presentation is made to a group of faculty members, mentor teachers, and fellow graduate students.

## Action Research Projects

In the following section, we describe action research studies conducted by students in four specialization areas: English Language Learners, Instructional Technology, Literacy, and Science. These studies were selected as being representative of the kind of projects undertaken by our M.S. in Elementary Education students. We describe these studies in order to provide a view of the process of the development and then implementation of students' action research projects.

### **English Language Learners**

This specialization began in Fall 2011 due to the influx of English Language Learners (ELLs) into local schools, and the need for pre-service teachers to be prepared to effectively work with these students. One pre-service teacher in this specialization chose to focus her action research study on improving understanding of homophones for ELLs (Montgomery, 2012). This pre-service teacher was placed in a first-grade classroom for her student teaching in a Title 1 school. There were five ELL students in this classroom, all of who struggled to learn new vocabulary. This pre-service teacher wondered how she could help the students learn and retain new vocabulary, specifically homophones which have shown to be particularly difficult for ELLs to differentiate (Opitz, 2009).

Through her review of literature related to effective instruction of ELLs, this pre-service teacher decided to use technology as a means to improve ELL students' knowledge of homophones (Helman, 2009; Lee, McLoughlin, & Chan 2007). In addition, she wanted to see if using technology would motivate ELLs to learn homophones.

The study took place over the course of a six-week period. With the purpose of the study to determine the effects of technology in learning homophones, the pre-service teacher used a comparative assessment to determine whether the ELLs benefited from the use of technology. She instructed the students

first mirroring current vocabulary instruction in the classroom, and then by using Apple iPods ® for instruction.

To begin, the pre-service teacher generated 12 grade-level homophone pairs. The homophone pairs chosen were based on a collaboration of Gentry's "Relative Frequency of Homophones in Children's Writing" and Dr. Edward B. Fry's *Fry's Instant 1000 Words*. Fry's word lists refer to the most common words used in the English Language in order of frequency.

During the first three weeks of the six-week intervention, two pairs of homophones were given at the beginning of each week during small reading group instruction mirroring the current teacher's instruction. The words were said, spelled and defined with a coordinating picture on a laminated index card. The students then wrote the words on a small white board. The Friday of the same week, a picture-matching assessment was given to each student to determine the students' retention of the words. The assessment had the homophones on the left side and the coordinating pictures on the right. The words and pictures were in no particular order. However, only three options of pictures were provided to help ensure that students were not just guessing at the answers. The procedure was repeated for three weeks.

During the second half of the six-week intervention period, Apple iPods ® were implemented for homophone instruction. The new homophone pairs were still introduced during small group instruction; however, now students used the iPods to learn the homophones. The pre-service teacher made a podcast for each homophone instructed during the second half of the research. Each podcast included the homophone, a coordinating picture, the word's spelling, and an appropriate sentence. The same kind of picture-matching assessments were given at the end of each week.

The results showed that the ELLs' assessment scores increased using the iPods to learn homophones. Every participant scored a 100% on his/her matching assessment after using the iPods compared to inconsistent scores prior to using the iPods. In addition, analyses of the observations demonstrated that the ELL students seemed to be more motivated while using the iPods compared to when working in small groups with the white boards. The ELLs remained focused longer and were not

distracted by external factors, such as classroom banter or student questions. While using the iPods, the ELLs' main focus was listening and looking at the iPod screen, where the homophone word, picture, and sentence were located.

## Instructional Technology

Van Ness (2012) examined the use of the Tag Reading System in a second grade classroom. The Tag system consists of a hand-held "smart-pen" that will selectively read words, pages, or an entire book to the student as the pen's tip is pressed to a word or icon on a page. The College of Education has a number of these pens and associated books, and the Tag system was introduced to students in the Instructional Technology seminar early in the Fall semester. Van Ness decided to use this system in a research study examining the effect these pens might have on lower-level readers' motivation to read. She quickly became proficient in using the pens, books, and associated software, and she used the system on a trial basis in her fall practicum classroom. During this time, she also met with her spring semester internship teacher to discuss implementing the research in her classroom. The classroom teacher was very excited about the project and worked with Van Ness to identify a group of students for the study.

As the fall semester progressed, Van Ness began to gather reference material for a literature review section, and, working with her host teacher and graduate advisor, began to develop methods for implementing the study and collecting data. By the end of the fall semester, Van Ness had prepared a formal research proposal.

In the study, titled *The Tag Reading System's Effect on Lower Level Readers' Motivation to Read*, Van Ness worked with three students who were classified as lower level readers, as determined by their performance on the Phonological Awareness and Literacy Screening. All three students participated in the school's Reading Resource Program. The study was conducted over several weeks, including a week at the beginning of the study set aside for familiarization in the use of the pens and books. Students used the pens and books during the second grade's I.E. (intervention and enrichment) block that takes place for 45 minutes every day. The participants read and worked with the books for about 15 minutes every day for four weeks. The students read fifteen different books during the study.

Van Ness gathered data from personal observations, interviews with the students, with the classroom and Reading Resource teachers, and data from student performance on content-related games and puzzles at the end of each book. She found an increase in motivation to read on the part of all three students during the study. The students asked to use the Tag readers and books during recess, lunch, and during other free time. She also noticed excited conversation among the three students as they discussed the books they had read, were currently reading, or planned to read. Part of this she attributed to the ability to hear and re-hear difficult words or passages. A student would not have to worry about possibly being embarrassed by continually asking a teacher to restate a word or go over a pronunciation. The pen would allow the student to hear the word or text as often as needed.

Van Ness also noticed the high level of interactive reading among the students. They did not use the available headphones, but rather, they held the pens to their ears as if they were talking on a cell phone. They were quick to share a particular passage or word among the group. Reading had become something of a social activity.

## Literacy

In fall 2010, a pre-service teacher in the literacy specialization decided to focus her action research study on writing in math and science (Pringle, 2011). She was placed in a fourth-grade classroom for her student teaching where the two teachers at that grade level team-taught. One was responsible for teaching math and science, and the other for teaching language arts and social studies. The pre-service teacher was placed with the teacher who instructed in math and science. The pre-service teacher had noted that when the students were asked to write in their math and science journals in class, the request was often met with “eye rolls and groans”. She wondered how to get the students more motivated to write in these critical content areas.

Through her review of the literature, she found that blogging had been used successfully to motivate students to write because blogs gave students the opportunity to write for a “real audience” (Richardson, 2006; Zawilinski, 2009). Writing in traditional composition books without the aid of graphics and without an audience may cause students to view content area

writing as boring and repetitive with little authentic purpose (Armstrong & Rettner, 2008). Students should see writing as a fun, yet purposeful, activity so that they may become more intrinsically motivated to write (Lam & Law, 2007). It was the goal of this pre-service teacher's action research to have her fourth grade students become motivated to write meaningful, content-immersed blog entries in place of using the more traditional classroom math or science journal. With the use of a classroom science/math blog, students posted writings of their own choosing about math and science, answered teacher-generated prompts, and entered internet-based discussions on the content with their classmates.

Data collected over thirteen weeks to look for evidence of motivation related to blog writing included: 1) pre and post study student questionnaires regarding students' opinion of math/science writing 2) student interviews 3) research field notes, and 4) comparison of student blog entries to traditional math/science journal entries.

Fourteen out of the twenty-eight participating students gave their consent to participate in the surveys and questionnaires used to collect data on their opinions toward writing. In order to analyze the results from the Likert scale questions each possible answer was assigned a point value (strongly disagree= 1, disagree= 2, not sure= 3, agree= 4, strongly agree= 5). An average score was then calculated for each student, the class as a whole, and each item presented in the survey. Average scores above 3 indicated a positive attitude toward writing, whereas scores below a 3 indicated a negative attitude toward writing. The average score of all fourteen students increased between the pre and post study surveys.

The free response portion of the questionnaire also reflected students' favor toward blog writing. Every student expressed that they enjoyed writing on the blog. Most students stated that they preferred writing about math and science on the blog to writing about the subjects in their notebooks. Students cited their main reason for this as being able to leave comments on other students' writing and receiving comments on their own postings. Some students also were more open to the idea of writing about math and science outside of assigned class work at the end of the study as expressed in their questionnaire answers. One student

expressed that she would write independently about math or science “if it was fun”. Another stated that independent writing would help him to “get smart”, and another student expressed that she would write about math or science outside of a school assignment as a way to teach her younger sister about the content.

As a whole class, there was more enthusiasm toward writing on the blog than writing on paper. For example, some students would answer multiple blog prompts per week. As a contrast, most students had to be reminded several times to turn in their notebook writing and most students did not complete the assignment. One student mentioned that it felt ‘more important’ to write on the blog than to write in his notebook because he knew that others would have the ability to read his writing. Students liked the idea of being able to share their thoughts with others, even mentioning that they wanted to help others with the content they were writing about on the blog. In addition, the perception of “an audience” encouraged students to keep proper writing mechanics in mind when composing their blog posts. Presenting their thoughts on a topic in a public way and receiving feedback through comments showed students that their thoughts were valued and could be influential to others.

## Science

Maynard (2012), in a study titled *Do teacher read alouds promote understanding and interest of science concepts in first grade students?*, examined the use of content-related children’s literature as an introduction to a science unit. She and her internship teacher’s interest in the use of children’s literature in science teaching guided the selection of this topic. The fall semester was spent choosing appropriate books for the study and developing methods for data collection. As with all studies, Maynard developed a formal proposal presentation for review by the faculty at the end of the fall semester. The project was implemented during the spring semester.

For this study, Maynard decided to focus on ten students, randomly selected from her first grade classroom. All students in the class would listen to the read-aloud, but only the selected students would provide data for the study. The research took place over the course of three, one-week science units. At the beginning of each unit Maynard would administer a pre-test to the ten students, examining their knowledge regarding the

upcoming content. She would then begin the science class by reading a content-related children's literature book. This was followed by a post-test (same questions as in the pre-test) for the study group. At the beginning of the second day of the unit, Maynard would ask the students in the study group to draw a picture of something they remembered from the book read the previous day. She also interviewed students and the host teacher at the conclusion of the study, determining interest in and enjoyment of the read-alouds.

Maynard found an increase in post-test scores for two out of the three units. The first unit, dealing with seasons, showed no change. She suggested that seasons would be a topic students are quite familiar with, so they would have little difficulty answering the general knowledge questions presented on the tests. Students were not as familiar with the other two topics, hibernation and migration, and they wouldn't be able to draw upon the same level of prior knowledge for the test. The illustrations provided additional evidence of the benefit of an introductory read-aloud. For one of the books, seven of the ten students produced a drawing that was directly related to knowledge that had been gained only from the text. Of the pictures, the two best showed a bear sleeping in a cave and a pile of snakes huddled together to stay warm. Both of these pictures demonstrated that knowledge was gained and retained directly from the read-aloud book.

The interviews with participating students provided additional information as to why the books might be helpful. Student greatly anticipated the read-alouds and often preferred that part of the unit to other activities. They also enjoyed the pictures, and many comments suggested that the pictures were the most memorable part of the read-aloud.

## Conclusion

The process of developing and implementing an action research project has become an intricate part of the teacher preparation program at the University (pseudonym). Going through the process of action research engages our students in highly reflective teaching. They become accustomed to the notion of researching a teaching strategy or approach before bringing it into the classroom. As indicated by Peters & Gray (2007), pre-

service teachers can “learn best if they actually experience the process of inquiry...and if their learning experience is grounded in their own practices” (p. 327). Our next step is to collect data about how our pre-service teachers feel they benefit from their action research projects, and what they might change about the process. This is an essential component to assessing the success of our teacher education program.

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